

CLIMBING AND PASSING LANE PRIORITIZATION STUDY

Technical Advisory Committee Meeting # 2
September 19, 2013



Agenda

- ▣ Introductions
- ▣ ADOT Partnering Process
- ▣ Working Paper 1: State-of-the-Practice Research Summary
- ▣ *"Before and After"* Passing/Climbing Lanes - Crash Analysis Results
- ▣ Draft Passing Lanes Methodology
- ▣ Draft Climbing Lanes Methodology
- ▣ Project Status Update
 - ADOT District Meetings
 - COG/MPO Coordination
- ▣ Schedule
- ▣ Next Steps
- ▣ Questions

ADOT Partnering Process

▣ Project Charter

CHARTER

Climbing and Passing Lane Prioritization Study

Champions: Rick Powers and Matt Carpenter

MISSION STATEMENT

Develop a needs based prioritization for Climbing and Passing Lane locations on the Arizona State Highway System

GOALS

Quality - Enhance safety and improve mobility; when typical design standards can't be met, reference the 2010 Highway Safety Manual for additional guidance; work towards objective and needs based prioritization for climbing and passing lanes; consider best practices from other states

Communication - Create a website to house climbing and passing lane study documents; reach every team member and/or intended recipient when communicating

Issue Resolution - Be proactive with resolving issues; understand the process for how this team moves issues forward and resolve issues timely; discuss at TAC meetings as necessary to communicate decisions to all team members

Teamwork - Interrelationships understood; work together to meet the challenge; take ownership of the study

Schedule - Keep and attend scheduled meetings; meet the delivery dates for the prioritization

Budget - Identify projects that can realistically be programmed; sensitivity to the route and route continuity (best bang for the dollar); communicate the need for specified funding for climbing/passing lanes

Project Delivery - Reach consensus on how to prioritize; include functional class factor when setting priorities; prepare a needs based prioritization that is defensible and can be reviewed annually – the end result is the list

ADOT Partnering Process

Partnering Evaluation Program Form

PARTNERING EVALUATION PROGRAM (PEP)											
CONSTRUCTION											
Project Name: <u>Climbing/Passing Lane Study</u>		Evaluation Month: _____									
Your Name: _____		Your Organization: _____									
Evaluation Criteria and Scores											
(1) Quality Enhancing safety and increasing mobility; review the 2010 Highway Safety Manual when standards can't be met; work towards object, needs based prioritization for climbing and passing lanes; consider best practices from other states		Significant Problems		Performed Below Expectations		Met Expectations		Exceeded Expectations		Don't Know	
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0		
		Comments:									<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition
(2) Communication Create a website to house climbing and passing lane study documents; reach every team member and/or intended recipient when communicating		Below Levels to Support Project		At Marginally Acceptable Levels		At Expected Levels		Exceeding Expectations		Don't Know	
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0		
		Comments:									<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition
(3) Issue Resolution Be proactive in issue resolution. Clarify and resolve issues timely. Appropriate feedback at all levels. Resolve issues at the level closest to the issue.		Not Functioning		Functioning, but Untimely		Established and Functioning		Exceeding Expectations		Don't Know	
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0		
		Comments:									<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition
(4) Team Work & Relationships Interrelationships understood; work together to meet the challenge; take ownership of the study		Not Yet Been Achieved		Occurred in Most Cases		Met Expectations		Exceeded Expectations		Don't Know	
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0		
		Comments:									<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition
(5) Schedule Keep and attend scheduled meetings; meet the delivery dates for the prioritization		Unresponsive		Marginally Successful		Meeting Expectations		Exceeding Expectations		Don't Know	
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0		
		Comments:									<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition

ADOT Partnering Process

Partnering Evaluation Program Form

(6) Budget Project that can realistically be programmed; sensitivity to the route and route continuity (best bang for the dollar); communicate the need for specified funding for climbing/passing lanes	Unresponsive		Marginally Successful		Meeting Expectations		Exceeding Expectations	Don't Know	
	0.5	1.0	1.5	2.0	2.5	3.0	3.5		4.0
	Comments:								
	<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition								
(7) Project Delivery Functional class factor input from team when setting priorities; consensus on how to prioritize; needs based prioritization that will be reviewed annually and that is defensible – the end result is the list	Unresponsive		Marginally Successful		Meeting Expectations		Exceeding Expectations	Don't Know	
	0.5	1.0	1.5	2.0	2.5	3.0	3.5		4.0
	Comments:								
	<input type="checkbox"/> Take Action <input type="checkbox"/> Neutral <input type="checkbox"/> Provide Recognition								

Please return form to:

Matt Carpenter
Mail Drop 310B

OR

Matt Carpenter
Planning Program Manager
Arizona Department of Transportation
Multimodal Planning Division
206 S. 17th Ave., MD 310B
Phoenix, AZ 85007

State-of-the-Practice Research Summary

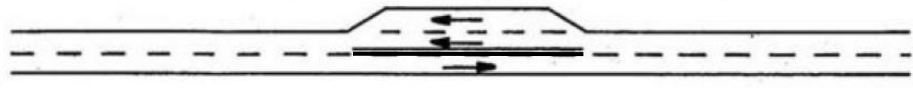
Study 1: Design Guidelines for Passing Lanes on Two-Lane Two-Way Rural Roads in Kansas - Kansas DOT (1985)

- Study examined 76 passing lanes in 12 states. Reduction of accidents of 30 to 50% in nearly all cases
- Process - Network level screening then project level screening
- Location Criteria – Safety, improved LOS, design consistent with driver expectation, minimized construction costs

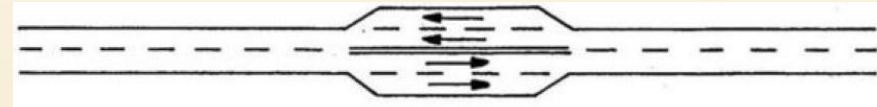
Study 2: Benefits and Design/Location for Passing Lanes - Missouri DOT (2003)

- Improvement in LOS. Reduction in crash frequency
- Process - Network level screening then project level screening
- Evaluated passing lane configurations - Isolated passing lane, separated passing lanes, adjoining passing lanes, alternating passing lanes, overlapping passing lanes, side-by-side passing lanes

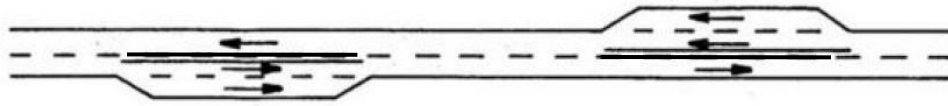
State of the Practice Research Summary



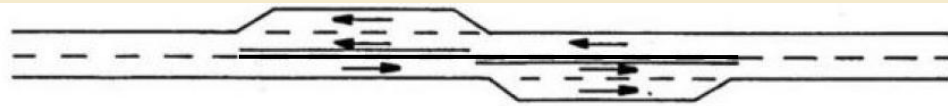
Isolated Passing Lane



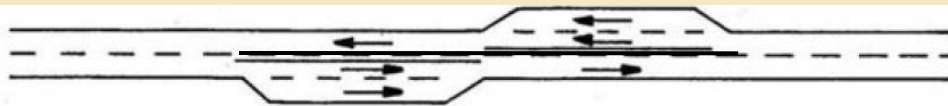
Short Four-Lane Section



Intermittent Passing Lanes, Separated



Intermittent Passing Lanes, Adjoining Tail-to-Tail



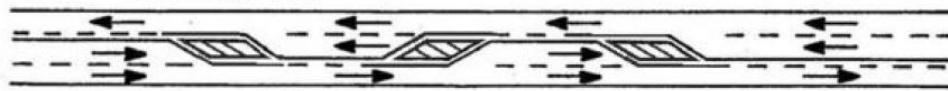
Intermittent Passing Lanes, Adjoining Head-to-Head



Intermittent Passing Lanes, Overlapping



2+1 Configuration



Continuous Passing Lanes

Passing Lane Configuration Types

State of the Practice Research Summary

Study 3: Evaluating the Performance and Making Best Use of Passing Relief Lanes – Michigan DOT

- Study examined 10 passing lanes in 12 states. Reduction of accidents in nearly all cases

Study 4: Road Planning and Design Manual: Chapter 15 - Auxiliary Lanes

- Guidelines and requirements for passing and climbing lanes are very similar to AASHTO

Reached out to five other DOTs (Nevada, Colorado, Texas, New Mexico, and Missouri) – Did not receive any responses

"Before and After" Passing/Climbing Lanes - Crash Analysis Results

Route	Milepost	<u>Total Crashes</u> Before / After	Percent Change in Crashes	<u>Crash Rate</u> Before / After	<u>Injury Crash Rate</u> Before / After
SR 64 - NB	MP188.26 - MP189.22	23 / 7	70%	2.9 / 0.67	0.94 / 0.1
SR 64 - NB	MP220.01 - MP221.51	14 / 11	21%	1.16 / 1.28	0.77 / 0.18
SR 64 - SB	MP244.84 - MP225.91	14 / 11	21%	1.45 / 1.08	0.41 / 0.1
SR 95 - SB	MP170.67 - MP171.32	23 / 11	52%	0.93 / 0.51	0.44 / 0.28
US 160 - EB	MP320.82 - MP322.48	6 / 8	-33%	0.16 / 0.18	0.07 / 0.14
SR 77 - NB/SB	MP365.12 - 370.51	20 / 14	30%	0.83 / 0.64	0.21 / 0.18
SR 260 - WB	MP316.21 - MP316.87	27 / 16	41%	1.97 / 2.03	0.29 / 0.25
US 89 - SB	MP500.15 - MP501.12	4 / 2	50%	0.48 / 0.26	0.12 / 0
US 89 - NB	MP501.77 - MP502.65	5 / 4	20%	0.61 / 0.52	0.12 / 0.39
US 60 - EB	MP238.71 - MP239.52	25 / 19	24%	2.19 / 1.63	1.05 / 0.77
SR 87 – SB (CL)	MP205.39 - MP206.96	25 / 11	56%	1.56 / 0.58	0.62 / 0.1
I- 40 – WB (CL)	MP66.87 - MP71.29	51 / 37	27%	0.45 / 0.4	0.14 / 0.1

"Before and After" Passing/Climbing Lanes - Crash Analysis Results

▣ Passing Lanes

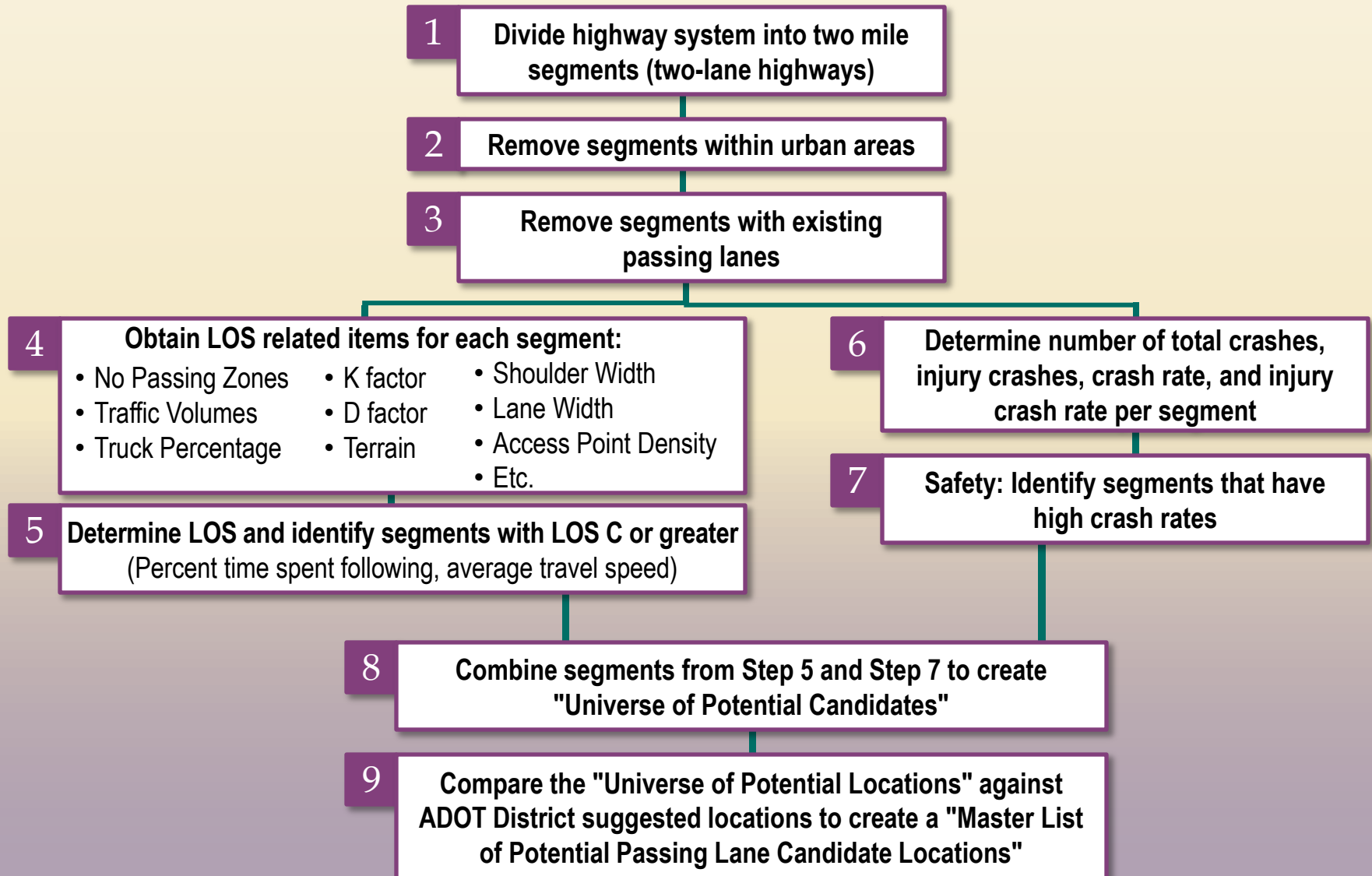
- In most cases, Passing Lanes reduced crash rates significantly
- LOS has also improved at Passing Lane locations

▣ Climbing Lanes

- Only one location had sufficient data for analysis – Resulted in reduced number of crashes
- Not enough sample size to determine if a climbing lane results in a reduction of crash rates

Preliminary Passing Lanes Methodology

Identification Process



Preliminary Passing Lanes Methodology

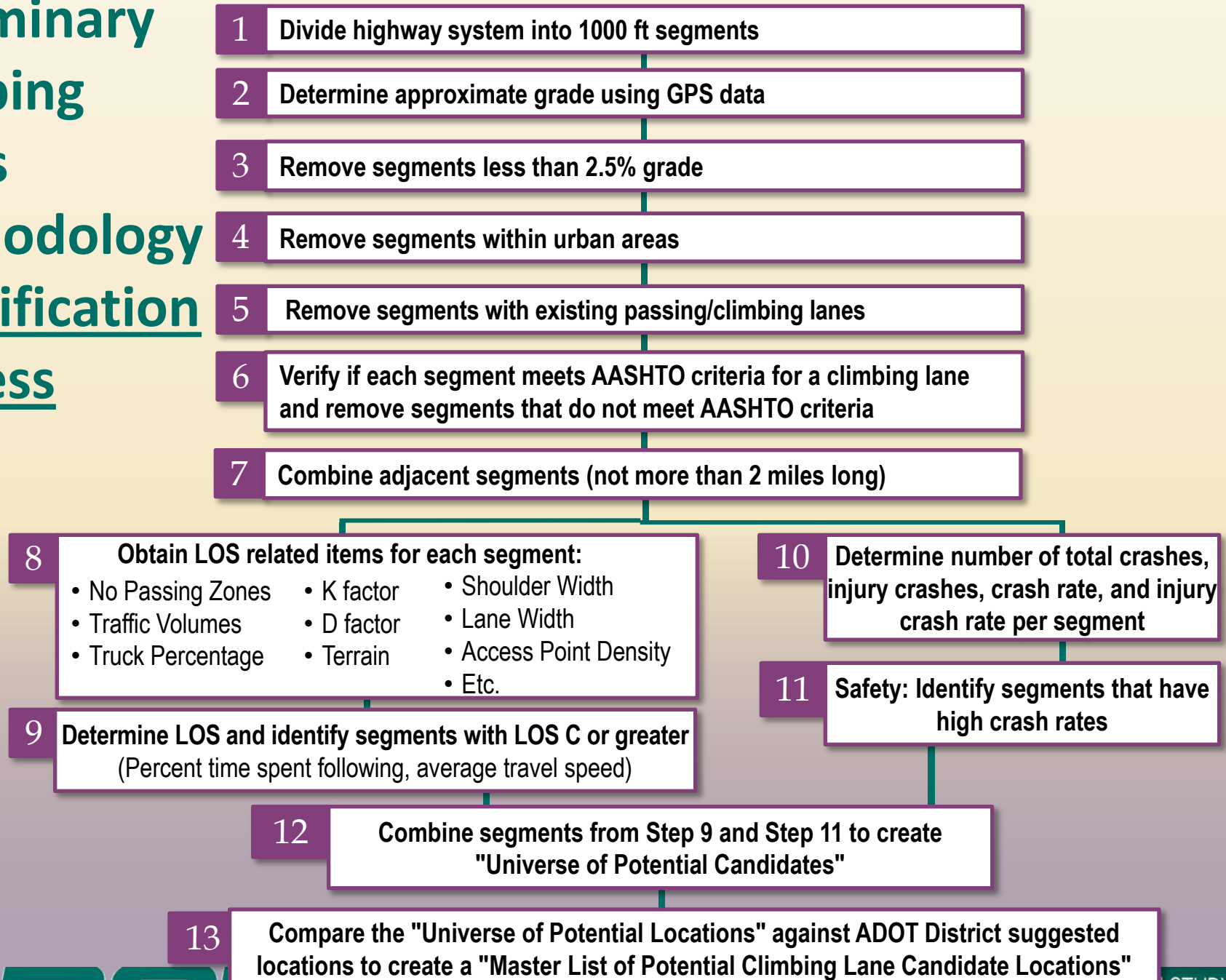
Prioritization Process

1 Utilize the following factors and assign weights to each factor and determine the score for each candidate segment:

- Existing LOS: Percent Time Spent Following
- Existing LOS: Average Travel Speed
- Overall Existing Crash Rate
- Existing Injury Crash Rate
- Predicted Future Crash Rate
- Future LOS
- Planning Level Cost Estimates
- Construction Feasibility Review Score
- Proximity to other passing lanes

2 Group Candidate Locations into Three Tiers: High, Medium, and Low Priority

Preliminary Climbing Lanes Methodology Identification Process



Preliminary Climbing Lanes Methodology

Prioritization Process

1 Utilize the following factors and assign weights to each factor and determine the score for each candidate segment:

- Existing LOS: Percent Time Spent Following
- Existing LOS: Average Travel Speed
- Overall Existing Crash Rate
- Existing Injury Crash Rate
- Predicted Future Crash Rate
- Future LOS
- Planning Level Cost Estimates
- Construction Feasibility Review Score
- Proximity to other passing/climbing lanes (two-lane highways only)

2 Group Candidate Locations into Three Tiers: High, Medium, and Low Priority

Project Status Update

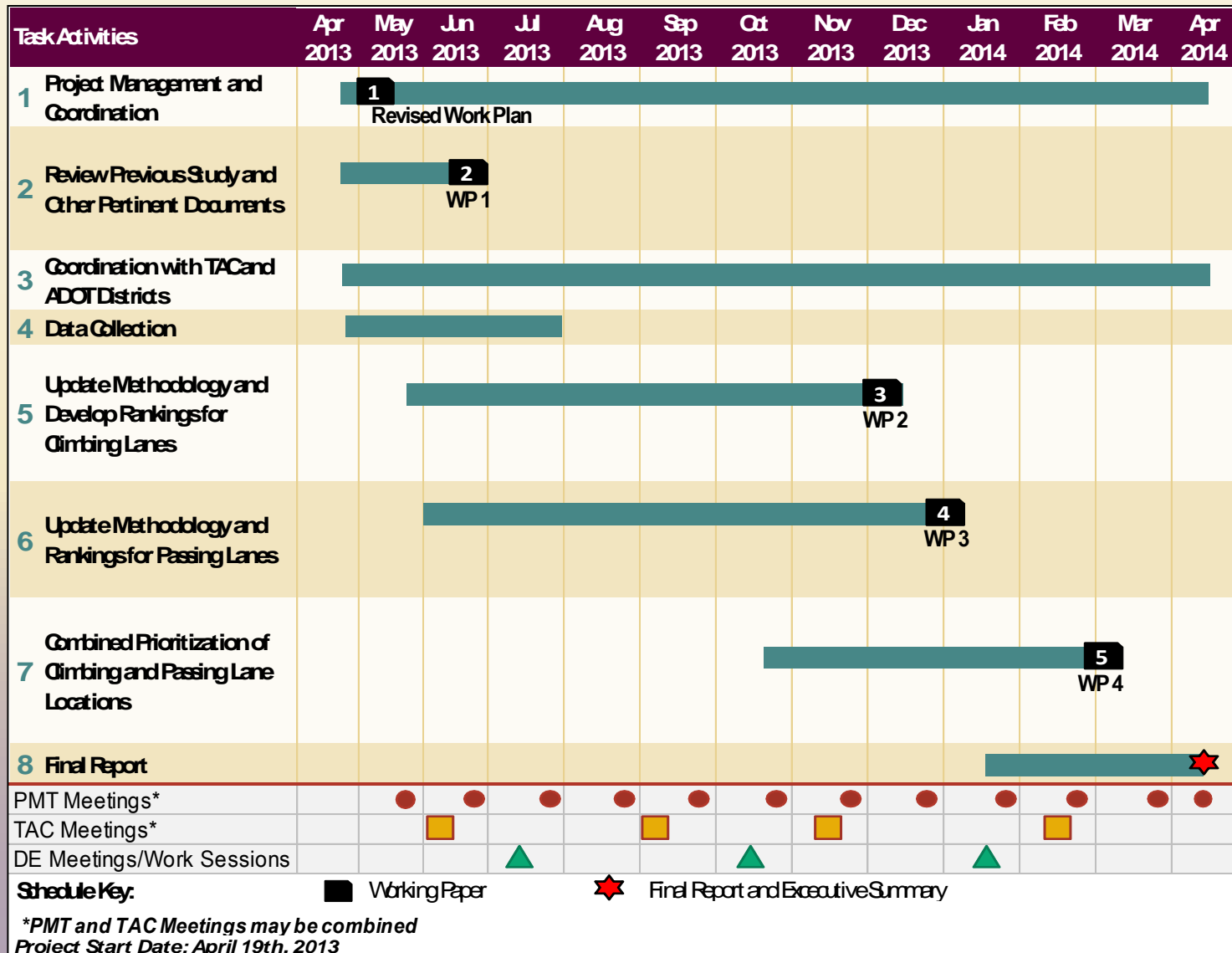
▣ ADOT District Work Sessions

- Provided each District with a list of previous study candidate locations
- Obtained each District's revised list of candidate locations
- Next Steps: Review District preferences against technical analysis and develop final recommendations

▣ COG / MPO Coordination

- In Progress: Preparing exhibits showing existing passing/climbing lanes and ADOT District's preliminary candidate locations
- COG / MPO letters and exhibits will be emailed next week
- If required by the COG / MPO, we will follow up with a phone/WebEx discussion

Schedule



Next Steps

- ▣ Continue technical analysis and finalizing of prioritization methodology
- ▣ Complete coordination with COG/MPOs
- ▣ Next TAC meeting in November, 2013
- ▣ Prepare Draft Working Paper 2 and 3

Questions?